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PLANETARY PHENOMENA FOR MAY AND JUNE,  
1909.

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BY MALCOLM MCNEILL.

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PHASES OF THE MOON, PACIFIC TIME.

Full Moon.....	May 5, 4 <sup>h</sup> 8 <sup>m</sup> A.M.	Full Moon.....	June 3, 5 <sup>h</sup> 25 <sup>m</sup> P.M.
Last Quarter...	" 12, 1 45 P.M.	Last Quarter...	" 10, 6 43 P.M.
New Moon....	" 19, 5 42 A.M.	New Moon....	" 17, 3 28 P.M.
First Quarter..	" 26, 5 28 P.M.	First Quarter..	" 25, 10 43 A.M.

There will be two eclipses during June.

The first is a total eclipse of the Moon on June 3d, and it will be visible in part at least over the United States, except the extreme western portion. For the extreme eastern states total eclipse begins shortly before sunset, while for the states along the Pacific Coast the eclipse will be about ended at sunset.

The second is a central eclipse of the Sun on June 17th, the line of central eclipse running from Siberia across the Arctic Ocean and south through Greenland. On the central line it is an annular eclipse at the beginning and end of its path and a total eclipse in the middle part. It will be visible as a partial eclipse in the late afternoon throughout the United States, except that part south of a line running from San Francisco southeast into the Gulf of Mexico. The local times for beginning and end at Ogden, Utah, are 4<sup>h</sup> 48<sup>m</sup> P.M. and 6<sup>h</sup> 3<sup>m</sup> P.M.

The summer solstice, the time when the Sun reaches its most northerly point, occurs June 21st, 6<sup>h</sup> P.M., Pacific time.

*Mercury* passed superior conjunction with the Sun on April 1st and became an evening star, and will remain an evening star until June 14th, when it passes inferior conjunction and becomes a morning star. The month of May affords the best time of the present year for seeing the planet. On May 1st the interval between the setting of the Sun and of the planet is just about one hour, and this interval rapidly increases as

the planet moves out toward greatest east elongation. It is increased by the circumstance that the planet is in the northern half of its orbit, reaching greatest heliocentric latitude on May 9th. By the middle of the month the planet does not set until nearly two hours after sunset. Greatest eastern elongation is reached on May 20th. The distance from the Sun is then  $22^{\circ} 23'$ , about an average greatest elongation. After greatest elongation the planet and Sun approach each other, but on June 1st the planet will not set until an hour and a quarter after sunset. It will therefore still be visible in the early days of June. After passing inferior conjunction on June 14th the distance between planet and Sun increases rapidly, so that by the end of the month the planet rises about an hour before sunrise.

*Venus* became an evening star on passing superior conjunction April 28th, and will remain an evening star until after the close of the year. On May 1st it sets only two minutes after sunset and remains too near the Sun for naked-eye visibility until after the middle of the month, and until the middle of June it sets less than an hour after sunset. It will not be a conspicuous object until autumn.

*Mars* rises at about  $1^{\text{h}} 40^{\text{m}}$  A.M. on May 1st, and at about  $11^{\text{h}} 30^{\text{m}}$  P.M. on June 28th. It moves about  $36^{\circ}$  eastward and  $12^{\circ}$  northward, from *Capricorn* through *Aquarius* into *Pisces*. Its distance from the Earth diminishes from 104,000,000 miles on May 1st, to 64,000,000 on June 30th, and its brightness nearly trebles during the two months. It is, however, at the end of June only one third as bright as it will be at opposition in late September.

*Jupiter* is in fine position for evening observation, being above the horizon on May 1st until about  $2^{\text{h}} 30^{\text{m}}$  A.M. It sets earlier as the month advances, but remains above the horizon as late as  $10^{\text{h}} 40^{\text{m}}$  P.M. on June 30th. It is stationary among the stars on May 1st, but begins to move slowly eastward, gradually increasing its rate until by the end of June it is nearly  $5^{\circ}$  east and  $2^{\circ}$  south of its position on May 1st.

*Saturn* became a morning star early in April. By May 1st it rises not quite an hour before sunrise, and by June 30th it rises about half an hour after midnight. It is in the constel-

## 82 *Publications of the Astronomical Society, &c.*

lation *Pisces* and moves about  $5^{\circ}$  east and  $2^{\circ}$  north during the two months.

*Uranus* rises shortly after midnight on May 1st, and shortly after 8<sup>h</sup> P.M. on June 30th. It is in *Sagittarius*, east and north of the bowl of the "milk-dipper," and moves somewhat more than  $1^{\circ}$  westward during the period.

*Neptune* is in *Gemini* and is in the western sky in the evening. *Venus* passes a little less than  $2^{\circ}$  north on the evening of June 22d.

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